

Addition of Fungal Disease of Weeds from Marathwada Region (M.S) India

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ABSTRACT

A study of fungal disease of weeds was undertaken during 2022 and 2023 in the districts of Marathwada region such as Jalna and Chhatrapati Sambhajinagar. Frequently fields were visited during the monsoon season followed by winter in the forest, crop fields and along the roadside. During the survey many weeds were found infected showing leaf spot, leaf blotch, leaf blight and tip wilting symptoms on the foliage of plants. Of this, leaf spot disease caused by fungi was taken into consideration of host weeds, which affects Crop, Human and Natural vegetation. 09 weeds viz *Amorpha fruticosa*, *Bambusa vulgaris*, *Cassia tora*, *Ipomoea obscura*, *Plumbago zeylanica*, *Parthenium hysterophorus*, *Trema orientalis*, *Tricodesma indicum* and *Woodfordia fruticosa* were found infected. A new disease was reported on *Amorpha*.

Keywords: *Parthenium*, Forest, *Cassia*, Marathwada, Weeds,

I. INTRODUCTION

Weeds are a problem in both crop production and with human, associated with declines in crop yields and quality, as an aesthetic nuisance and as a source of allergenic pollen (Harding and Raizada, 2015). Major problems caused by weeds include interfering and competing with cultivated and desirable plants for space, light, water and soil nutrients, reducing crop yields, interference with cultural operations and harvest, and serving as alternate hosts for other crops pests and diseases. Some weeds produce chemicals that are toxic to crop plants and animals and can cause allergic reactions in humans. The study of plant diseases is important as they cause loss to the plant as

well as plant produce. The various types of losses occur in the field, in storage or any time between sowing and consumption of produce. The diseases are responsible for direct monetary loss and material loss. Weeds represent one of the major kinds of pests worldwide which reduce yield and the quality of crops. Of the total annual loss of agricultural products due to various pests in India, weeds roughly account for 37%, insects for 29%, diseases for 22% and other pests for 12% (Vikas et.al 2017 and Yaduraju 2006). Approximately 85% of plant diseases are found to be caused by fungi, which comprise the largest number of plant pathogens. Serious plant diseases are caused by fungi. Worldwide analysis shows that about 19,000 fungi are known to produce diseases in plants [Jain

et.al. 2019]. Weed is a plant that grows in undesired places. place is defined by humans and depends on specific situations. So, weeds are plants that interfere with human activity. In an ecological sense, a weed is one of the partners in the ecosystem in which it develops. Weeds become problem plants when the need of the weed species forces to compete with the crop plant or natural vegetation.

The competition is for growth factors such as nutrients, water, space and sunlight. Agriculture has decreased natural vegetation for thousands of years. Weeds grow in forest, gardens, orchards and along with crop plants. But this growth of weed is not desired along with the crop. These undesired plants deplete the nutrients, water and space allotted for the intended crop, and finally cause huge reduction in crop yield. Weeds, in crop field, reduce input efficiency, interfere with agricultural operations, impair quality and act as alternate hosts for several insect pests and diseases (Naidu, V.S.G.R. 2012). Weeds, like pathogens, are pests of crops and some of the worst are parasites which are close to some fungal diseases in their mode of attachment to the host. Most weeds have close association with the crop but can cause severe losses by competition for the available nutrients or water in the soil, or for light. Weed competition is typically severe during the initial growth stage of crops' life. There are also indirect effects of weed growth which include effects on crop quality, increased costs of eradication and influence on pests and diseases. Weeds are the main host plants of Fungi, Bacteria, Viruses and Mycoplasma (MLO), which cause disease to Forest and crop plants (Terry and Parker 2002). Disease can be defined as any physiological disturbance of the normal functioning of a plant because of a detrimental interaction between the pathogen, the environment, and the host (Agrios, 1988). Plant diseases caused by viruses and mollicutes, and to a lesser degree by fungi and bacteria, are commonly transmitted by insects from weeds. Aphids, whiteflies, leafhoppers, and thrips are the most common vectors of plant disease because they have

piercing-sucking mouthparts, and in some cases secrete the disease propagules as they feed (Hunter 2004). In most cases it is not possible to prevent some disease-bearing insects from lighting and feeding on a crop, and it is usually not possible to cure plants once they have become infected with plant disease, insect-transmitted disease is a formidable problem. Elimination of the source of the disease and vectors is often the most effective approach to management, and this often means weed control (Agrios 1997).

II. MATERIALS AND METHODS:

Weed sample were collected from fields from two years 2022 and 2023 and brought to the laboratory for further investigation. Weeds plant identification was done by determining the taxonomic position of host, samples of flowers, leaves and stem were collected and studied in the laboratory, Naik, V.N. (1998) and Naidu, V.S.G.R. (2012). The plants infected with leaves were examined carefully in the field and description was recorded, as suggested by Rangaswami, G. and A. Mahadevan (2005). PDA was prepared in the usual way Aneja, K.R. (1993). Symptoms were recorded immediately, and associated pathogens were identified in the laboratory by using standard monographs and taxonomic keys Barnett & Hunter (1972), Gilman, J.C. (1945), Barnett, H.L. (1956), Alexopoulos, C.J. and E.S. Beneke (1962), Bilgrami K.S. and Jamaluddin, Rizwi MA. (1991).

III.RESULTS AND DISCUSSION:

Botanical name: *Amorpha fruticosa* L.

Pathogen: - *Cylindrosporium passaloroides* Gilm and Arch.

Locality: - Phulambri

Leaf spots occur in variety of shapes and sizes. Spots usually are seen first on the lower and inner branches where humidity is higher, and leaves are shade. Disease adversely affects the foliage of host plants. The symptoms appear as minute chlorotic lesions,

spherical to oval, brown to black in color, and measures as 2-6 mm in diameter (Fig.1). Initially spots appear on upper side of leaves, which later spread down towards the petioles. In severe cases, necrosis takes place, spots enlarge in size and coalesce resulting in blighting of leaves. In few cases, weak plants are easily infected and severely attacked, even they may die. This disease originates during monsoon season and finds to be new as not reported earlier.

Botanical name: *Bambusa vulgaris* L.

Pathogen: - *Diplodia bambusae* Ell. & Large.

Locality: - Ajanta

Infection manifested as minute greyish brown linear to spindle-shaped lesions near margin, base and tip of both young and mature leaves and measures as 2-5 mm in diameter (Fig.2). The lesions coalesced and caused necrosis of the affected leaf tissues. Infection spread downward under warm-humid conditions. Usually, leaf tips were found severely affected which led to leaf tip blight. Similar disease was reported from Bengal by (Roy, 1948).

Botanical name: *Cassia tora* L.

Pathogen: - *Curvularia lunata* (Wakker) Boedijn.

Locality: - Karmad.

Leaf spots were observed as minute greyish brown watersoaked lesions on the mature leaves. In humid conditions, the individual lesions coalesced to form large oval spot to irregular lesions with greyish white and light brown margin (Fig.3). The diseased areas became necrotic and under high humidity sporulation of the fungus occurred as greyish black spore mass on the adaxial surface of the necrotic lesions. Severe infection led to the spread of lesions to the entire leaf lamina followed by withering of the affected leaves and premature defoliation. This disease was reported by (Sahni, 1966) From Jabalpur.

Botanical name: *Ipomoea obscura* Ker- Gawl.

Pathogen: - *Diplodia mandorae* Shreemali & Bilgrami.

Locality: - Jalna

Infection appeared as water-soaked lesions with yellow halo on young and mature leaves. The lesions coalesced and formed circular to irregular brown spots

which measure 4-6 mm in diameter (Fig.4). In severe infection spots drop out and shot holes occur on the leaf. The lesions developed near the leaf tips and margins coalesced fast and formed large necrotic areas and few of leaf dried and detached from plant. Similar disease was reported by (Shreemali and Bilgrami in 1972).

Botanical name: *Plumbago zeylanica* L.

Pathogen: - *Pithomyces chartarum* (Berk & Curt.) Ell.

Locality: - Badnapur

The disease is manifested as small, pinhead sized, greyish brown, water-soaked lesions, which later spread and coalesced to form oval to circular necrotic lesions with dark greyish brown irregular margin. Brown water-soaked spots with yellow halos that appear on the leaf margins (Fig.5), which measure 8-10 mm in diameter. In severe cases entire leaf is covered by infection and leaf wilting occurs. This disease was reported by (Ponappa 1970).

Botanical name: *Parthenium hysterophorus* L.

Pathogen: - *Alternaria alternata* (Fr.) Keissler.

Locality: - Bhokardan

The symptoms appeared as small, central and marginal brown or black spots scattered on leaves. The spots became irregular in shape. When their size increased, they turned brown to black in colour (Fig.6.). Several such lesions may coalesce resulting in leaf drying. Few spots are grey green in colour with white margins and becoming black at maturity. (Aggarwal et.al. 2014 and Rao 1964) reported the disease on same host.

Botanical name: *Trema orientalis* L.

Pathogen: - *Cercospora tremae* (Stevens & Solheim) Chupp.

Locality: - Somthana

The characteristic symptoms of the disease are visible on both the surfaces of leaf. Old leaves are more susceptible than young ones. Firstly, spots appear regularly to irregular in shape, dark brown in color and measure 8-10 mm in diameter (Fig.7). As the disease advances, spots turn black and brown, which soon become surrounded by a concentric ring. With the enlargement of lesions, infected portions become

white in centre and increase in number, scattered over the leaf. The infection is more pronounced in terminal portion of leaf. In some cases, leaf blighting, chlorosis, wilting and still leaves tend to remain hang. Similar Disease was noted by (Thirumalachar and Govindu 1953).

Botanical name: *Tricodesma indicum* (Linn) R. Br.

Pathogen: - *Cercospora tricodesmatis* Govindu & Thirum.

Locality: - Rajur

This disease occurs chiefly on the older leaves of young plants. The disease symptoms appear on leaf lamina on upper side of the leaf. Lesions, at the beginning of the disease development, appear round, circular, oval with irregular borders, pale brown in color surrounded by yellow halo, few in number and measure 6-8 mm in diameter (Fig.8). In severe infection, leaves turn pale yellow, shed prematurely, necrotic tissue fall giving shot hole appearance. Majority of the trees were found to be infected in fields showing similar symptoms. This disease was noted during monsoon season. (Govindu and Thirumalachar, 1955) noted the similar disease.

Botanical name: *Woodfordia fruticose* (Linn) Kurz.

Pathogen: - *Cercospora woodfordiae* Petch.

Locality: - Rajur

The characteristic symptoms of this disease were noted on upper side of the leaves except leaf margin. Spots observed were regular-irregular, Dead, discolored, or injured areas of tissue. Spots with distinct margins that can be brown, black, tan, or reddish in color. Spots that can range in size from 8-12mm in diameter (Fig.9). Sydow and Mcrac (1929) reported similar disease.

IV. CONCLUSION:

During the study, weeds found to be an alternate host for many fungi causing diseases to crop and fruit plants, due to which yield losses and fruit damage occurs. Among the 09 weed plants, one new disease is reported on *Amorpha. Parthenium hysterophorous* a

toxic weed, which shows allergic symptoms to humans, was found harvested along with *Triticum aestivum* (wheat) with harvesting machine during winter. As seed size of parthenium is too small compared with wheat, which are grinded in flour machine to prepare bread or it's by product. Most rural people do not clean or grade the seeds after harvesting. Eradication and elimination of *Parthenium* weed is a need before harvesting of similar height crop.

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Figs.1-9:1. *Cylindrosporium passaloroides* on *Amorpha fruticosa* 2. *Diplodia bambusae* on *Bambusa vulgaris* 3. *Curvularia lunata* on *Cassia tora* 4. *Diplodia mandorae* on *Ipomoea obscura* 5. *Pithomyces chartarum* on *Plumbago zeylanica* 6. *Alternaria alternata* on *Parthenium hysterophorus* 7. *Cercospora tremae* on *Trema orientalis* 8. *Cercospora tricondesmatis* on *Tricondesma indicum* 9. *Cercospora woodfordiae* on *Woodfordia fruticosa*.